

Why do leaves change colour?

- chlorophyll chromatography—

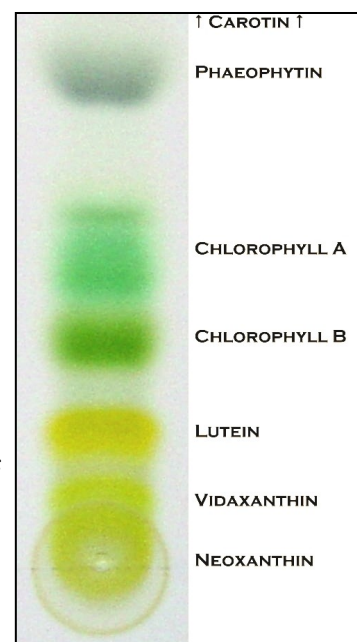
Plants use a green pigment called chlorophyll to capture the energy of the sun and store that energy as sugar. That stored energy can be used later at night when the plant needs energy and cannot photosynthesis. Chlorophyll is green, and it hides the other coloured pigments that are in leaves. In autumn, chlorophyll breaks down because there's not enough sunlight to perform photosynthesis. When chlorophyll breaks down, the other pigments in the leaves start to show.

Why does it happen?

This is a technique called chromatography, it works because when you put the paper into the solvent, the solvent is drawn up into the paper by surface tension. This means that there is a flow of liquid over the paper. Some substances spend more time in the solvent and others spend more time on the paper, so they move at different speeds, and get separated out.

Why was there more than one colour of green?

This particular set of substrate and solvent has been optimised to separate out different forms of chlorophyll - the pigment which gives plants their colour and is used in photosynthesis. There are 4 types of chlorophyll each having a different absorption spectra. There are two main types found in plants, both which look green but one bluer and the other yellower, so you see two greens. This means that the plant can absorb a greater range of colours of light, and wastes less of the spectrum.



What you will need:

- Filter paper
- Sticky Tape
- Acetone
- Beaker
- Stirrer

Method

1. Cut a piece of filter paper about 2cm wide and a bit longer than your jar is tall.
2. Place your leaf over the top of the strip and rub a line across the strip about 2cm from the bottom with the blunt end of the stirrer.
3. Now add acetone to the bottom of your jar, 2cm is plenty. **The demonstrators will assist.**
4. Attach the filter paper to the stirrer and tape it. Suspend your strip of paper so the bottom end is sticking 2cm into the acetone.
5. Wait a few minutes, with any luck you should see an interesting effect.